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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/717,896

11/21/2003

Michio Takagaki

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EXAMINER

RAABE, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/717,896

Applicant(s)

TAKAGAKI ET AL.

Examiner

Christopher M. Raabe

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4 and 5 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. Amendment filed September 27, 2005 has been entered and acknowledged by the examiner.

2. Applicant's arguments filed September 27, 2005 have been fully considered but they are not persuasive.

The applicant argues, with regard to the rejection of claim 1 (previously claim 3), that Matthews et al. (USPN 5239230) do not teach the ratio of an inner diameter D2 of a glass bulb at tips of opposing electrodes to an inner diameter D1 of a glass bulb at the middle part between opposing electrodes ($D2/D1$) being 0.5 to 1.0. The examiner asserts that Matthews et al. do teach (at column 2, lines 29-36, and again at column 7, lines 5-30) an arc tube having the claimed ratio. In particular, the examiner would like to note the ellipsoidal shape, the arc gap, bulb diameter, and bulb length. Matthews et al. disclose an arc gap less than half the bulb length and bulb diameter less than the bulb length. As an ellipsoid, the diameter at the electrode tips will necessarily be less than at the center (and hence $D2/D1 < 1.0$), and since the electrode gap is less than half the bulb length and bulb diameter less than the bulb length, the diameter at the electrode tips will be greater than 70% of the diameter at the center (hence $D2/D1 > 0.5$ (note: 70% is approximation (rounded down) of the of extreme-value case of spherical ellipsoid and bulb gap equal to half the bulb length)). Since Matthews et al. do disclose a range within the claimed range, the rejection is maintained.

The applicant argues, with regard to the rejection of claim 4, that Ishigami et al. (U.S. Patent 6353289) do not disclose the ratio of the tube current to the diameter of the electrodes. The examiner asserts that Ishigami et al. do disclose a tube current and an electrode diameter,

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and their ratio does fall within the claimed range. Since Ishigami et al. do disclose values within the claimed range, the rejection is maintained.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 1,2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (U.S. Patent 6265827), in view of Eastlund et al. (U.S. Pre-grant Publication 2002/0070668) and Matthews et al. (U.S. Patent 5239230).

With regard to claim 1,

Takahashi et al. disclose a mercury-free arc tube for a discharge lamp unit comprising: a spheroidal closed glass bulb (column 1, lines 17-18); a pinch seal on each end of the closed glass bulb (103 of fig 12); and opposing electrodes disposed in the glass bulb (104 of fig. 12),

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the glass bulb being filled with a primary light-emitting metal halide and a starting rare gas (column 4, lines 4-9), a pressure of the starting rare gas being 8 to 20 atm (column 3, line 5), wherein an inner diameter of the glass bulb at a middle part between the opposing electrodes is 1.5 to 2.7 mm (column 7, lines 40-41, 50-51), a distance between the opposing electrodes is 1.0 to 4.0 mm (column 7, line 51), and a stable discharge is produced with a power of 15 to 30 W (column 10, lines 36-40).

Takahashi et al. do not disclose a length each of the electrodes extends into the glass bulb, nor a ratio of an inner diameter D2 of the glass bulb at tips of the opposing electrodes to an inner diameter D1 of the glass bulb at the middle part between the opposing electrodes ($D2/D1$) being 0.5 to 1.0.

Matthews et al. do disclose a ratio of an inner diameter D2 of a glass bulb at tips of opposing electrodes to an inner diameter D1 of a glass bulb at the middle part between opposing electrodes ($D2/D1$) being 0.5 to 1.0 (column 2, lines 29-36).

Eastlund et al. do disclose a length each of the electrodes extends into the glass bulb being 0.3 to 1.8 mm (paragraph 82).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the dimensions disclosed by Eastlund et al. into the mercury-free arc tube for a discharge lamp unit of Takahashi et al. in order to provide a good arc with ample luminescence.

With regard to claim 2,

Takahashi et al. a mercury-free arc tube, further comprising a buffer metal halide (column 4, lines 7-11), wherein the primary light-emitting metal halide is at least one member selected from an Na halide, an Sc halide, and a Dy halide (column 4, lines 5-6), the buffer

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metal halide is at least one member selected from an Al halide, a Cs halide, an Ho halide, an In halide, a Tl halide, a Tm halide, and a Zn halide (column 4, lines 7-11; column 7, lines 50-62; and column 9, lines 15-20), the total amount of the metal halides in the glass bulb is 10 to 30 mg/ml, and the ratio of the buffer metal halide to the total amount of the metal halides is 0 to 50% by weight (column 9, lines 15-22; and column 7, line 50).

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. and Eastlund et al. as applied to claim 1 above, and further in view of Ishigami et al. (U.S. Patent 6353289).

With regard to claim 4,

Takahashi et al. disclose a mercury-free arc tube.

Takahashi et al. do not disclose a ratio of a tube current I (unit: A) supplied to the arc tube to the outer diameter d (unit: mm) of the electrodes sticking out inside the glass bulb (I/d) being 1.0 to 4.0 (A/mm).

Ishigami et al. do disclose a ration of a tube current I (unit: A) supplied to the arc tube to the outer diameter d (unit: mm) of the electrodes sticking out inside the glass bulb (I/d) being 1.0 to 4.0 (A/mm) (column 41, 55-60, and column 39, lines 5-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the dimensions disclosed by Ishigami et al. into the mercury-free arc tube of Takahashi et al. in order to provide good arc and ample luminescence.

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6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. and Eastlund et al. as applied to claim 1 above, and further in view of Ishigami et al. (U.S. Patent 6353289) and Cox et al. (U.S. Patent 4949003).

With regard to claim 5,

Takahashi et al. disclose a mercury-free arc tube.

Takahashi et al. do not disclose a cylindrical glass shroud integrally welded to said arc tube to provide a closed space enclosing the glass bulb, the closed space being filled with an inert gas at a pressure of 1 atm or lower.

Ishigami et al. do disclose a cylindrical glass shroud to provide a closed space enclosing a glass bulb (column 17, lines 39-43), the closed space being filled with an inert gas at a pressure of 1 atm or lower (column 33, lines 46-47).

Cox et al. do disclose a cylindrical glass shroud integrally welded to an arc tube (column 10, lines 15-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the glass shroud of Ishigami et al. and Cox et al. into the mercury-free arc tube of Takahashi et al. in order to protect the glass bulb from the outside environment.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Raabe whose telephone number is 571-272-8434. The examiner can normally be reached on m-f 7am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CR

Ashok Patel
ASHOK PATEL
PRIMARY EXAMINER